CLAIMS

1. Pseudo-isothermal chemical reactor (1) for heterogeneous chemical reactions comprising a substantially cylindrical shell (2) having axis (Z-Z), a reaction zone (5) defined in said shell (2) and at least one heat exchange unit (6), supported in said reaction zone (5) and comprising a plurality of heat exchangers (7), characterized in that at least one of said heat exchangers (7) consists of a coil obtained from a single tubular element and has substantially parallelepiped, flattened overall dimensions.

2. Chemical reactor according to claim 1, characterized in that said heat exchanger (7) comprises a plurality of tubular, parallel rectilinear portions (8), connected together head-to-tail by a corresponding plurality of curvilinear fitting portions (9).

3. Chemical reactor according to claim 2, characterized in that said tubular rectilinear portions (8) are of equal length and have coplanar longitudinal axes.

4. Chemical reactor according to claim 3, characterized in that said curvilinear portions (9) are semicircular.

5. Chemical reactor according to claim 3, characterized in that said rectilinear portions (8) of said coil exchangers (7) extend radially in said reaction zone (5).

6. Chemical reactor according to claim 3, characterized in that said rectilinear portions (8) of said coil exchangers (7) extend in said reaction zone (5) substantially parallel to the axis (Z-Z) of the shell (2).

7. Chemical reactor according to claim 1, characterized in that said heat exchange unit comprising a plurality of said coil heat exchangers (7) has a substantially cylindrical configuration, coaxial and concentric to said reaction zone (5), in which it is supported, in said heat exchange unit (6) the coil heat exchangers (7) being arranged radially.

8. Chemical reactor according to claim 7, characterized in that in said heat exchange unit (6), the coil heat exchangers (7) are arranged radially in many coaxial and concentric arrangements.

9. Chemical reactor according to any one of the previous claims, characterized in that, at least one of said coil heat exchangers (7) comprises an additional duct (18) supplying operating heat exchange fluid, associated with the exchanger itself in a predetermined intermediate position of the respective coil.

10. Chemical reactor according to claim 3, characterized in that said rectilinear portions (8) of said coil exchangers (7) extend parallel to a diameter of the shell

(2).

11. Chemical reactor according to claim 10, characterized in that said coil exchangers (7) are arranged on imaginary equidistant parallel planes.

12. Chemical reactor according to claim 11, characterized in that said curvilinear fitting portions (9) are tangent to imaginary cylindrical surfaces (22, 23, 24, 25, 26, 27) having a radius equal to the inner radius of the shell (2) and centres all arranged on the same diameter (D1) of the shell (2).